

" THE JOURNAL "

Official Organ of the

AUSTRALIAN MODEL RAILWAY ASSOCIATION

For All Who Are Interested in Scale
Model Railroading

-Member Australian Standards Association-

Affiliated with the Australian Association of
Model Societies.

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EDITORIAL

It is indeed gratifying to watch the continuing steady growth of our Association. With the first century on the board, an Honorary Membership which the Association was most happy to ask Mr. T. Collier, now in full charge of Traffic, V.R., to accept; new faces appearing at each State Branch meeting with everyone keenly interested in the hobby and in the other fellows model, and the lusty roll-ups to each new visit to the V.R., the whole show has that keen spirit which is apparent in an up-and-coming progressive organization. With a full Committee also, our Secretary can now get his breath back, as many jobs he was doing are now being looked after by enthusiastic new Committeemen such as Jack Chaplin, doing a real job on the Buyer's Guide, the production of which is due to Ernie Dean and despatch by Dave Gross. Mayer Levy is the power behind the 'JOURNAL' as he tees up all supplies, collects Ern Mainka's Fordigraph and does the duplicating. The whole show is simply a co-operative effort of all.

Another good thing is that kindred bodies are extending invitations to our members to join them on their outings, such as the V.M.R.S's recent most successful and enjoyable diesel railcar trip to Queenscliff; this trip has been written-up in this issue by a 'Roving Reporter' whose breezy article you are sure to enjoy. And then the Australian Electric Traction Association who invited our chaps to be with them on their outing to Bendigo on 11th April last, to celebrate the 50th year of trolley electric tramways in that interesting and most hospitable old city, a trip which proved to be a most thoroughly enjoyable and interesting day. Such interchange of visits by members of diverse yet kindred organizations is an excellent thing and one of the best mediums for broadening one's outlook and fostering and promoting intelligent tolerance of others' hobbies allied with our own but not quite up the same street.

HOW TO MAKE YOUR OWN AUTOMATIC, 'O' GAUGE, COLOUR-LITE SIGNALS by N. Levin.

(continued from page 24, February issue)

For those interested only in 3-aspect signalling, the first section of drawings shows the hooded type fitted with three aspects. Three aspect signalling was devised for mainline traffic where signal sections were short, to give the driver an indication of the position of the next signal.

Summing up, with 2-aspect signals the driver is either clear to go, or is compelled to stop at the signal, but with 3-aspect signalling, the driver when approaching the signal ahead of the one that is set at danger sees it set at the caution position, and realizes that the next signal may be at danger.

Not many modellers use 3-aspect signalling due to the fact that a long length of mainline track is required for 3 or more sections. From this, don't get the idea that you can't pass turnouts, etc. with 3-aspect signals; Circuits for this and other features will follow next issue, so, on with the job.

The building of the 3-aspect signal is the same as that described for the 2-aspect job.

Marker lights are used to show the driver of a train whether the signal he is approaching is automatic, or controlled. If the signal is automatic the lights of the signals and the marker light are seen as a diagonal across the mast, if the signal is controlled the lights are seen as one above the other or in a vertical line. The application of this is that when a train is stopped by an automatic signal, the driver stops his train and waits for 30 seconds, if the signal is still at danger he may take the train past at slow speed (having re-set the trip, struck as the train passed the signal)

and continue into the section until he reaches the next signal or train in that section. Thus the signal may be faulty, rail or bond broken or another train in the section which has been held up, or broken down. At a controlled signal (that is one controlled from a signalbox at crossings, turnouts, etc.,) the driver halts his train and remains there until the signal is cleared or the signaller issues a docket allowing him to pass the signal, and enter the section. A later article will show that marker lights may be coloured other than red, and how this affects a train.

MAST AND SUPERSTRUCTURE CONSTRUCTION

On the drawing you will notice the dimension from ground to the marker light is shown as 'H'. In prototype the signal heights vary according to background, i.e., the driver's view may be distracted or obscured due to coloured lights behind the signal, looking into the sun, exit from tunnels, etc., so dimension 'H' is left to the Engineer-in-charge of Signals to fill in when the ordering is being done.

Find what heights you require your signals ('H' is usually $4\frac{1}{8}"$ for Starters.)

DIMENSIONS GIVEN WILL BE THOSE WHERE 'H' IS $4\frac{1}{8}"$, where it differs keep approximately same proportion.

CONSTRUCTION:

Cut piece of $\frac{1}{4}"$ brass tube $3"$ long.

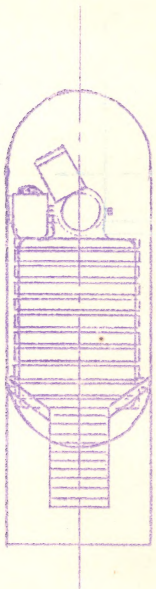
Cut piece of $\frac{3}{16}"$ brass tube $4\frac{1}{4}"$.

Fit $\frac{3}{16}"$ tube into $\frac{1}{4}"$ tube for $\frac{1}{4}"$ and sweat there leaving fillet of solder to file into shape shown in Fig. 1.

Cut base from piece of tinplate, to shape and size shown in Fig. 2, and solder $\frac{1}{8}"$ up $\frac{1}{4}"$ tube.

Slot mast and feed wires in.

Now fix signal hood in position on the left side of mast as you look at front of signal.



PLAN

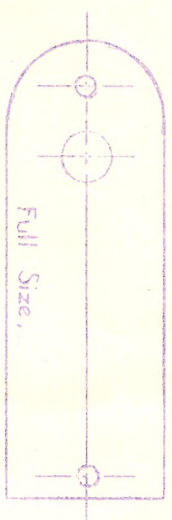


Fig. 2.

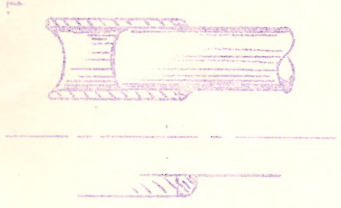


Fig. 1.

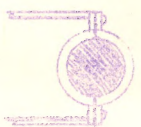


Fig. 5.

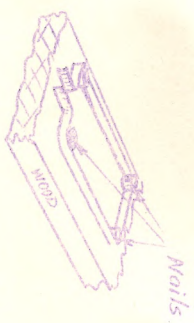


Fig. 4.

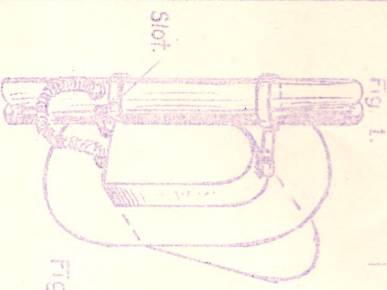


Fig. 3.



Fig. 7.

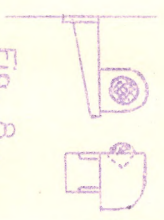


Fig. 8.

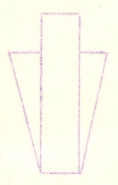
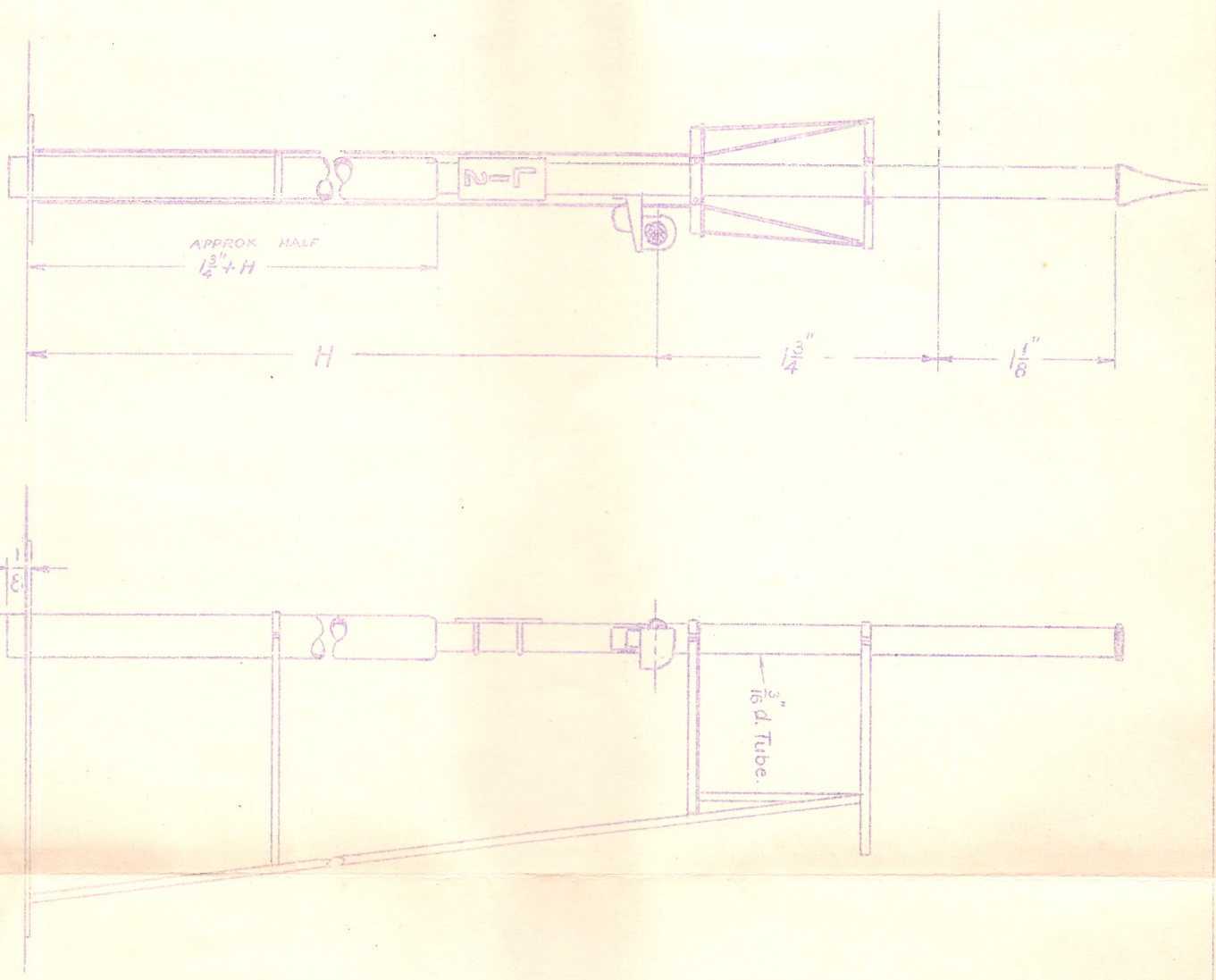


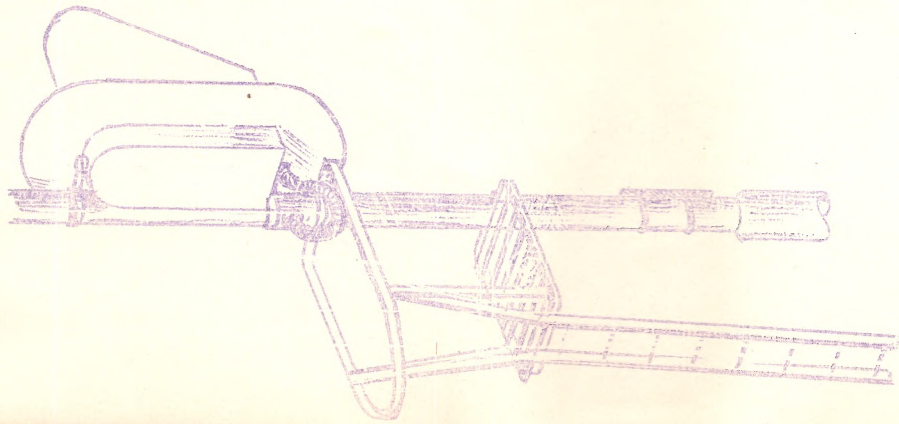
Fig. 6.



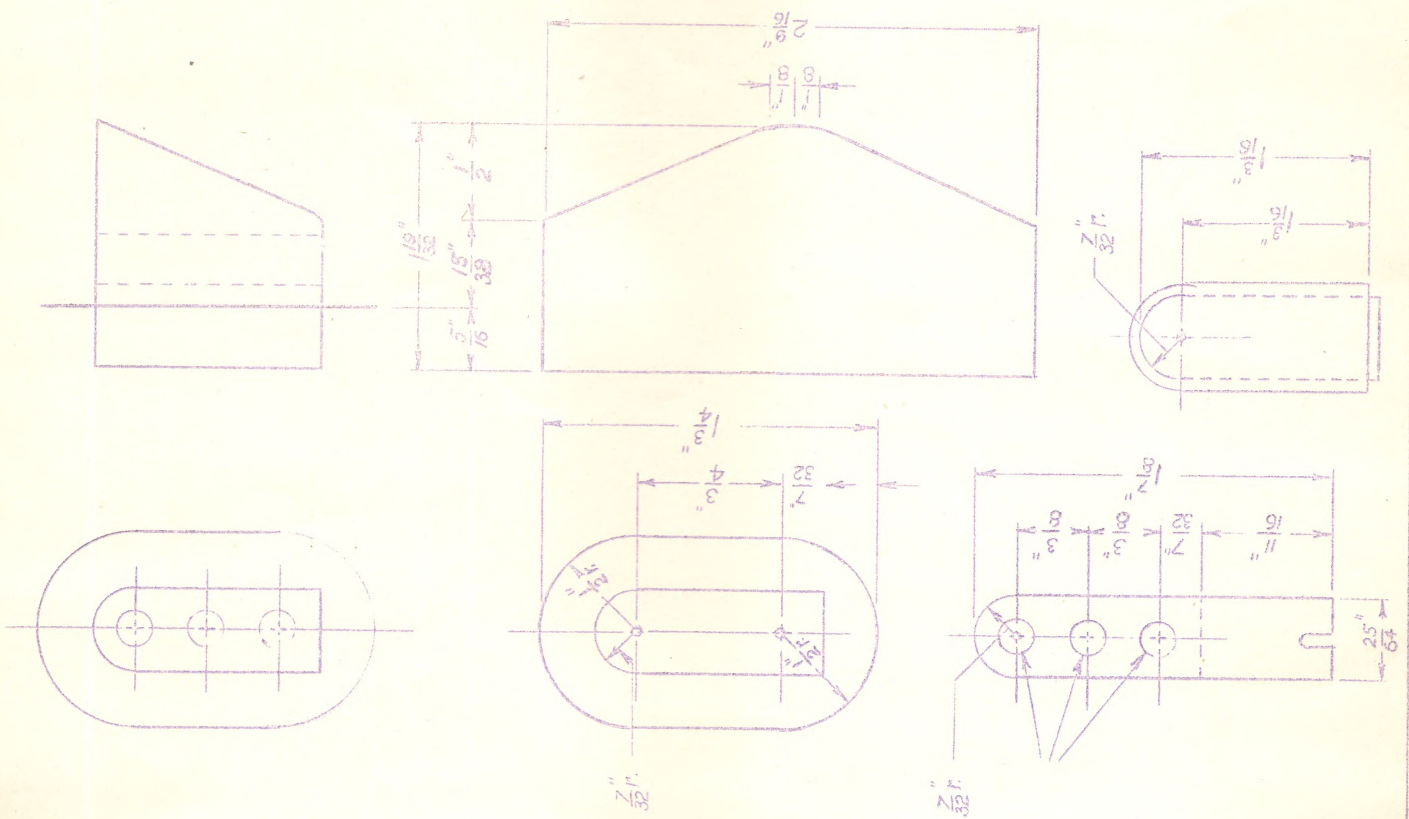
SCALE: FULL SIZE: FOR DIMENSIONS MEASURE DIRECT

SIGNALS COLOUR-LITE.
MAST & STRUCTURE.
10" GAUGE SCALE: FULL SIZE.
DRAWN BY N. LEVIN. 2.3.53.
FOR USE BY A.M.R.A.

SIGNALS. COLOUR-LITE.
3 ASPECT. STRUCTURE.
10" GAUGE. SCALE: FULL SIZE.
DRAWN by N. LEVIN. 22. 4. 53.
FOR USE BY AMIRA.



VIEW of STRUCTURE.



If signal is a Controlled Starter for a track on the right of a platform it is permissible to fit hood to right of mast (so that hood is on track side of mast) The hood may be fixed in several ways:

- (a) Solder the hood direct to the mast.
- (b) Solder hood brackets to mast as in

Fig. 3, as done in prototype. (The signal lights are adjusted to give the clearest indication at distance required in prototype, by these brackets)

To bend the guard rails to shape we can make up another small jig. The sharp bends are approximately the diameter of a 3" nail, and the larger can be formed by small brads around the shape of the half-circle. Mark the outline of the rail on a piece of wood, drive the 3" nails in position and cut off with saw, fixing brads around larger curve, as in Fig. 4. Slight adjustment will be necessary due to spring. Another jig can be made for the bending of footrails as in Fig. 5.

Using strips of 1/16" tinplate (bought or cut yourself) make up these shapes - one per signal.

Solder in position as in sketch. In prototype they are bolted to a clamp strap, so if you want detail shape as in Fig. 6 and solder to mast.

Cut ladder to length and solder in position.

With strip tinplate solder footplates onto rail and also solder on the 4 vertical handrails.

Cut to length and solder the 2 horizontal ladder steadies with bolt plate. (1/16" tinplate)

Cut and bend to shape in tinplate the marker-light bracket, Figs. 7 & 8.

File marker-light from piece of scrap brass. Some have hoods, some do not, so you have a fair amount of latitude with the prototype. Drill to depth of drill point in front to take red diamante, see Fig. 8.

Solder bracket to mast in position, and then solder the light onto the bracket, then fit hood if you are using same.

Using a piece of 15-20mm. copper wire,

shape to cable-lead, and solder to base of marker-light and to the rear of the mast. As in Fig. 3. or photo. of prototype.

Using a piece of 1/16" copper wire shape to cable lead for the main signal and solder to the base of the hood (clear of the lamp cover) and to the rear of the mast. See Fig. 3, and photo.

Cut No. plate to size, and solder to mast.

On most colour light signals there is a footplate out in front of the mast for the maintenance man to stand on whilst cleaning the lens fronts. This is bolted just above the footboard rails. See Fig. 3, cut out as in Fig. 7. solder bracket to mast, then solder plate onto it.

If you have a lathe you can turn up your own finials for the top of the mast. If you don't have a lathe then don't bother about them. During the war, a lot of the signals were installed and they were never fitted with finials. (They are still without them at Flinders St.) so here again the prototype allows some latitude.

Clean the signal down with soft rag to remove flux, a little kero, followed up with methylated spirit will make sure it is clean.

By now, if you stand back from the bench you should see an object that looks very much like a signal, so now out with the paint brush.

PAINTING:

MAST: Silver all the way.

SUPERSTRUCTURE: Black.

CLAMPS: Around mast - Black.

NUMBER PLATE: Black.

FINIAL: Black.

SIGNAL HOOD: Black all over.

BASE: Colour this when signal screwed down to base board - blend it with lineside colours.

FITTING SIGNAL TO TRACK:

Signals are always to the left side of track they control - in '0" gauge, approximately 2 5/8" from track centre.

INSTALLATION:

Drill $1/4''$ hole in baseboard $2\ 5/8''$ from centre of track, feed wires through and force $1/4''$ tube in, and screw signal down, then painting around base to correctly assimilate it to the local surroundings.

CORRECTION:

✓ On Page 23 of Feb. issue in Paragraph on Spectacle Holders, line 4, dimension given as $1/16''$ for length of ferrules, should read $1/4''$.

Next issue Nev. will continue his excellent articles with Circuits for 2 and 3-aspect signals, also ideas for Automatic signalling.

CENTRALIZED AND ROVING CAB CONTROL

By David Cross.

CAB CONTROL is nothing new to Modellers advanced in the Hobby but to the novice the term may not be readily understood. It applies to layouts using 2 or more controllers, and means briefly that a loco may be driven throughout the entire layout from the one controller or CAB without the use of any other cab. The operators or engineers have to know no more than where sections begin and end, and to have these sections lined up as travel progresses, and to simplify this, the sections can be indicated by use of signals.

Normal Cabs are known as Centralized Cabs being of fixed position on a control board and therefore compelling the driver to remain in the one position during the movement of a train. Thus the section switches and accessory switches are of necessity

combined in this centralized control unit. This is alright provided that all points and couplings operate 100% and by remote control, but whose railway operates that way? the term "railway" meaning in this case the average one built by the scale modeller and not an expensive toy outfit.

With Centralized Cab Control the driver therefore has to leave his cab to throw points and uncouple trains and on a large layout the exercise thus obtained makes a scale 8 hours operating as tiring as a prototype day's work. Also if a loco sticks up and won't start a bit more walking back and forth is done. The set-up is different with Roving Cab Control

ROVING CAB CONTROL. The Roving Cab in its bare essentials contains only a reversing switch and a speed control. It is connected to the switchboard by a long flexible and durable lead and is wired up via this lead in the same manner as the centralized cab. The advantage of a Roving Cab is that it may be carried about with you, the leads being able to reach to the extremities of the layout and therefore the driver may stroll over to points ahead of the train and operate them whilst being in complete control of the train. He may uncouple and shunt cars from the most convenient position and generally be with his train throughout the entire journey.

If sufficient Staff is available the sections may be operated from a centralized board by a skilled operator or towerman who is well versed in the sectionalizing of the layout, or by small local section boards which may be placed en route so that the driver may switch on the next sections as he approaches them and at the same time setting the points and also being at that position when his train arrives.

The size of a Roving Cab can be such that it will fit conveniently in one hand and be operated by that

band thus leaving the other free for uncoupling and point and section operating.

The wiring for Cab Control is no more complex than for the generally accepted division or sectional method of control yet it offers much greater scope, also, if the method of using local section boards is adopted a lot less wire is used as the leads go only a short way to each section.

In conclusion, I would be pleased to elaborate on having Cab Control to any members interested and invite inspection of this method in operation on the Sandy Pacific Railroad.

H.O. 2-Railers bring something to run when coming.

Cheerio for now,
Chief Maniac,
SANDY PACIFIC RAILROAD.

(Dave's address is: 13 Heath Street,
SANDRINGHAM, S.S.)

WE SAW:

V.M.R.S. FAN TRIP March 9, Labor Day

by our Roving Reporter.

Overhanging boughs and bushes dangling leaves along the car sides. Pull your head in, Mug! Ask Ford Niquet! Bill Fairlam saw one coming, retracted skull. Ford didn't -- slap! Oh well, all Railfans are mad!

Standing "in the hole" on the mainline to pass a late-running "Pass" making up time. That 'R' class was hitting 60 downgrade when Russ MacDonald pulled

his head in - Andy Lyell didn't, and he also didn't like it much because a flying lump of coal from the passing 'R' tapped him in the eye. Orter been grateful for the honour, but didn't even keep the piece as a souvenir. Ah well, all Railfans, etc. --

Branch from Geelong to Queenscliff is practically disused, weekly steam-hauled freight of a few trucks is normal traffic "volume" over this "streak o' rust". Our diesel railmotor and trailer rode surprisingly well, proof that gangers still keep a watchful eye on things. Unsung 'eroes!

Young bucks crowding the "Fans' Corner" up front armed with Working Timetables, watches an' things. A2 headed Passenger flashed past in dusty blur of red and brown cars -- "235 tons" calmly announced the 'Timetable Boys'. Made us feel old and unobservant.

One time single stall engine shed at Queenscliff, with loco doorway walled up, it's now the local Ice-works. But silver paint hadn't quite hidden the tail-tale smoke smudge up the wall where the door used to be. And outside, in the long grass, the faintly discernible outlines of the ashpit though the running rails have long since gone the way of all disused rail

Reg Stringer and young son busy lapping up ideas for that Micklesham 'O' gauge system while hanging far out various doors and windows. Who had the fishing tackle? Tide and wind all wrong, but nice in the sun on the pier, wasn't it? And who was the Infidel we saw with a copy of ---- we is us, on a railfan trip, too, "Truck and Bus Transportation" !!! No! it wasn't Andy Lyell, or Bill Fairlam, or ---- no! not in either

Our train loping down a long gentle grade with whistle blaring. Local "cocky" in a out-down jalopy blithely chugging towards crossing. Long whistle blasts changing to urgent "morse". Brake application

by our driver and careless cocky drove across to live today, by grace of V.R. brakes and 5 seconds. Proves that a little-used branchline and a "non-standard" "train-day" tally up with the local boys' famous last words, "no need to look and listen, there won't be a train today".

Ernie Mainka and good lady, and son and daughter. Ern probably intends dismantling his lovely new electrically operated 'O' gauge turntable and remodelling it to match the "armetrong" type at Queenscliff. The V.R. one doesn't work any more, Ern, a lot easier to model!

Stub switches on the pier at Queenscliff. Some still work, too. The train? A petrol engine on a 4-wheeled "boxcar" top speed approximately one MPH. Used for hauling boxes of fish.

Adults as well as children tumbling from houses along the branch to stare and wave at our blue and "gold" special. Allan Goods and family obviously enjoying themselves, along with Allan Shorter, and that Goods man left his "new" car at home, too! Lure of the train, we guess! Live steamer Reg Stamford shooting off yards of movie film while brother "Turly" soaked up prototype ideas for his Surrey Hills stud contact system.

Oh yes, and the long, dark tunnel out of Geelong station, and no lights in the cars. Tut! Tut! All those young gentlemen and lady friends, too. And who put the lights on for the return trip through the rathole? Shucks!

Familiar with mainline profiles, the leisurely meanderings of the branch over gently rolling countryside were something of a novelty. The "out-and-fill" of busy lines here supplanted by "down-in-the-dales" "up-over-the-rides" like a gentle "big dipper"

Nearing Queenscliff the line becomes a true "water-level" route, oft times skirting within a few yards of lapping water in the tidal flats.

Russ Siddall deep in conflag. with Dave Gross. What's the S.P.R. up to this time? Changing gauge without changing gauge, so rumour has it! Strange! How about an article on this phenoma, somebody? And what was in that enormous Gladstone bag Mrs Dave kept making Mr Dave carry, and Russ kept looking at, and licking his lips? Funny!

For better visibility on a sharp curve, the Home signal outside Queenscliff standing paint-peeled and forlorn on a bank about 40 yards away from the track

Jack Stranger infiltrating Queenscliff fort, past all those gun slits or embrasures or what have you. Didn't know the password, either, he didn't - just dead game, we think.

We ate sandwiches and scones. Bryan McClure settled for stew and trimmings at Geelong. Light tea, indeed! Fan near us most hurt because we only passed one train instead of published three on down trip timetable. Gonna tell Bill Fairlam, he said, because this was surely sabotage or somethin' by road hauliers association. (Gent with Truck and Bus rag please note)!"

The three American-built battery-powered 3-foot gauge locos of the Navy Dept. running out 3 miles to a deep, dark naval secret. Guards-"n"-all, they have slated for abandonment very soon in favour of motor trucks, so a chatty guard tells us. But no cameras, by order, and no demonstration of the locos. Can do 12 MPH, he did tell, with hint of pride. Sad days, these, for the little railroads.

The brilliant emerald of searchlight signals in the dusk as we sped towards the outskirts of Melbourne, at

the end of a perfect day. Weary people and sleepy kiddies - Platform 5, Spencer St.

Thanks a lot, V.M.R.S. boys for the opportunity of joining you. And special thanks and sincere congrats. for a well organized and happy outing.
Bill Fairlam.

Dave Gross asks --
ARE YOU A MODELLER?

Do you actually fit into the picture as a person who creates a representation of an object, to scale? Many so-called modellers are not modellers in effect, but are enthusiasts who may have a fair knowledge of the subject, but are not active in the practical sense.

In general, there are four types of model railroad enthusiasts:

Firstly there is the "Active" modeller who is always helpful to the seeker of information and can always show you something new, or being built, and his railroad is in a state of progression.

Secondly there is the "Dormant" modeller who, through unforeseen circumstances, has been compelled to put the tools away for the time being, but is always willing to show you his past handiwork. Quite often, he is a modeller of long experience, and is always helpful to the beginner.

Thirdly we come to the "Extinct" type, who is no longer a modeller but an enthusiast, mostly for the full-size railroads, and who always enjoys the social aspect which surrounds the hobby. He is definitely an armchair man, and finds his greatest audience amongst others of like ilk, and begin-

ners in the planning stage.

The fourth type of model enthusiast is the man who should be given every assistance by the other types - he is the beginner. The hobby is becoming more widespread each year, and keeping in line with that growth are the new developments, especially in the electrical sphere. It appears to the beginner, at first glance, that many aspects of the hobby are too complicated, therefore, it is up to the experienced men to encourage and help the beginner over the obstacles. With proper assistance, he will soon become an "Active" modeller and be of benefit to the hobby. As he gains in experience and knowledge he will also develop confidence, and be undoubtedly positive in response when asked, "Are you a modeller"

NEWPORT VR TRIP

Our latest VR tour of inspection, to the Newport Shops on March 29, was another great success. Forty-nine members rolled up and a most impressive convoy of 9 vehicles proceeded from Spencer Street Station Yard to the marshalling point at Newport. Here Trip Organizer, Jack Chaplin, got in touch with the Gatehouse at the Workshops through the Signalbox phone, and, after notifying the Watchman of our impending arrival, we were on our way.

First call was to the Erecting Shop where the outstanding "exhibit" was H220 undergoing a 'major', with other classes in various degrees of dismantling. Then we went through the Boiler Shop, absolutely quiet, in such contrast to the staccato din of a normal working day. Here we were able to see boilers from the rolled plate onwards to the completed boiler being lagged with its fitted jacket. There was interest even in the gloom of the Foundry which we

left to enter the timber-scented Patternshop. The pattern loft above contained literally tens of thousands of patterns big and small, and possibly dating back to the very commencement of the Railways; it would not be at all surprising were there some patterns of the old Hobson's Bay Railway Co. tucked away somewhere, but the 'piece d' resistance' was the pattern for a combined 3-cylinder and smokebox casting.

Leaving the Pattern Shop we were shown the wooden model of goods loco C1 built over a set of tracks of 21" gauge, and arranged for the driving wheels and motion to be operated by an electric motor. It is a cause for regret that such a splendid model is slowly deteriorating under a tarp in a small, open shed, when its rightful place would appear to be a conspicuous position in the Technological Museum where all would have the opportunity of seeing and operating this fine example of the pattern- and cabinet-makers' art. It is in quite a good state of preservation considering its housing and that it was built as a Recruiting medium during the 1914-18 war.

The Car Shop was interesting as some cattle and sheep trucks were building as well as repair and repaint jobs on carriages and diesel railcars.

We also saw over Steel Construction, the Blacksmith Shops and finally, the Graveyard.

An interesting old chap which it would be grand to see preserved some day as an early railway link was 2-4-2T No. 12, built in 1893 by the Melbourne Locomotive Works, 60 years old and still doing a job. Older still was T94, a tender 0-6-0 built in 1884, but now quietly dreaming - and rusting - away. Dreaming away, it seemed to me, as the old loco stood there, complete silence all around, amongst the weeds on a scrap track, in the late Autumn sunshine --

And were she able to talk, or one able to project one's self back into her heyday when she was the newest pride of the loco stable, what tales would be told of the early days of our railroading, of bell-topped officials and bowler-hatted crews, of bow-yanged gangers and 4- and 6-wheeled coaching stock, the gradual improvements effected in braking, in train lighting and Safeworking, the feverish extension of lines all over the State endeavouring to keep pace with gold development and the Land Boom, until it burst. And then, with her advancing years of service, she went out on her last passenger run and was detailed to freight work only - she, T94 - on a roadside freight now grimy and unpolished, and on the decline. Then along came the "D's" and the "A's" and "A2's" and she was further demoted to yard shunting and such menial work, around such time she lost her graceful funnel and had this improvised and out-of-form stack substituted as a good-enough job to finish out her days - until that day - when she moved under her own steam for the last time and found herself where I found her, on a scrap track, amongst the weeds, in her Autumn --- An old loco can talk to you if you can only stop and spare a few moments from the hurly-burly when all is quiet around her -----

Accompanying us throughout the tour was Watchman G.R. Smith, and I would like to record of him that it was not too much trouble to go wherever we wanted - and that was everywhere!... His parting remark was that he hoped he would see us there again sometime in the future, which is our wish, also. Many thanks to Mr Watts for his good nature, and once again to Mr T. Collier, our very good friend though known to but a few, by whose authority we were enabled to make yet another absorbing trip to the Victorian Railways

DON'T FORGET THE SWAP SHOP chaps if you want to get rid of something, or get hold of something instead

TOSS ASIDE YOUR TINSNIPS - Part FiveBy C. Richardson.

This is a horrible subject. Not because glueing something to something is difficult, but because the average modeller usually makes such an unholy mess of glueing, although for the life of me I can't see why. And whatever I, or anybody says, he will undoubtedly go on doing so. We can find an example of what I mean by going back to childhood days and recalling early attempts to spread jam on a slice of bread. A lot of the jam unaccountably got on the knife handle and then to our hands and from there it was only a matter of time before everything within reach, including our hair, was liberally coated with the stuff. From my own observation the tyro modeller, and many not now new to modelmaking seem to promptly revert to the bread and jam stage when confronted with two pieces of wood and a tube or jar of adhesive. This is silly, even if judged only from the viewpoint that applied glue, excepting that actually in a joint, is waste glue. The only exception to this being the fillet of cement sometimes run down the inside corner angle of a closed car body or building wall to provide added strength.

If we take the thought a little further and consider the work involved in trying to remove excess glue dribbles and sticky finger prints that have dried onto and into the fabric of a model - well; why not be sparing with the stuff in the first place? Anyway, I imagine the foregoing is as much wasted wordage, and those that slop glue all over everything will joyfully go on doing just that, the same as the "solder squanderer" on a metal job who bolts half a stick of solder into the construction of an inoffensive little 4-wheel vehicle, then spends hours trying unsuccessfully to dig it off again in what he hopefully calls "cleaning up" !!

There are probably hundreds of different brands and varieties of glues, cements, pastes, gums, mucilages, etc. etc., available in Australia today, and it would be safe to say that all of them are excellent products if used on the work for which they are designed. The various "names" listed above group the different types into loosely defined sections, but they overlap so much that it's nearly hopeless for the layman to say whether a certain product is strictly a gum, mucilage, both or neither! So let's forget it in this article, for it doesn't matter as long as the stuff sticks our job for us. There are so many varieties of the same thing offered on the retail market that it is just about impossible for any one person to have more than a superficial knowledge of the working characteristics of more than a couple of dozen of them. When someone asks what is the best glue to buy, the answer must be that the brand you yourself have used most is the one to use for general work, at least for a start. As a matter of interest I only use three "glues" in general model work: "Gluetex" liquid glue, (a prepared animal glue), Cellulose cement, (model aircraft cement), and Goodyear "Placbond", (A post-war synthetic product). I do not suggest that these three are the only adhesives I could or do use, or that they are better than, or inferior to, dozens of other products. They just happen to be the three mainstays of my own choice, and from long familiarity with them I can estimate within very narrow limits how each of them will behave under most circumstances. In this lies the secret of successful glueing - a thorough practical knowledge of the several types of your choice, not vague theory you hear expounded at the local club about a new tube glue with a shearing strain of ten million pounds, or something! Even if a glue is remarkably strong, this does not necessarily make it a modeller's glue, for generally speaking models don't get mishandled all that much, and ease of working and handling, under varying circumstances, method of packaging, and colour, are all important.

and I'm hanged if I want to stick my bits 'n' pieces together with black cement, which is the "colour" of one well-known and otherwise excellent adhesive. Most packaged brands of glue or cement carry labels giving simple directions for use of the product, and it is wise to follow these directions until enough is known of the peculiarities of a given brand before branching out with your own methods. However, I do suggest you forget one suggestion often given in manufacturers general directions, and that is the usual reference to the use of clamps. Clamping a glued joint is O.K. if the glue is being used in the construction of a table or chest of drawers or reasonably sized trinket box, but clamps, even tiny ones on a model are a confounded nuisance, or at least I find they are. Small pins used as nails are all that is required to hold model work while the glue sets, and a description of this was given in Part 3 in connection with the construction of a boxcar body.

I have assumed you will be, or are, using one or the other of the "ready-to-use" proprietary glues or cements on the retail market, though there are several types of glue that require preparation of some kind before use, the obvious example being ordinary joiner's glue, the pungent-smelling brew the cabinet maker has in his double boiler. Used by a craftsman, animal glue, (which is what it is), will make a wellnigh unbreakable joint. It is obviously not very convenient for model work, and is rarely used now that so many "ready-to-use" adhesives are available. I suppose the cold-water casein cement type of glue is the modern equivalent of joiner's glue, and is much used in the manufacture of mass-produced factory-made furniture, but here again the material is not popular in model building as we know it. First, because it has to be mixed before use, and secondly, and more importantly, it is fairly easy for the amateur to get a failure with this type of glue, particularly if the powder has been in

store for some time after manufacture. Yet I have in my possession several tins of casein cement powder made in 1938 which is still quite effective, although I have seen failures with this same brand of powder in quite recent months. For any large joinery work of my own I shall stick (no pun intended) to the old fashioned animal glue, even though many men swear by casein glue. So take your pick, fellers, it's up to you! Make a habit of finding out (by trial and error if your sense of smell can't tell you) what is a solvent for the particular glue or cement you intend to use. Then if a smear gets where it shouldn't, a quick wipe with a cloth damped in the solvent will keep the work clean as the proverbial whistle - and your fingers, too! A solvent, ofcourse, being a liquid which will not on and quickly dissolve the glue, as an example, butyl acetate or amyl acetate being solvents for aircraft cement. Amyl acetate is sometimes called 'banana oil', particularly in America, it's pungent odor being not unlike that of ripe bananas.

Methyl methacrylate sheet is a synthetic substance used to some extent these days in H.O. rolling stock bodies and other railway components. You can use the above scientific name if you want to air your knowledge of technical terms, but in Gt. Britain and this country we will know what you are talking about if you call it by it's trade name, "Perspex".

The car bodies I am referring to are apparently made by pressing a heat softened piece of Perspex into a die to form the details, for example, the side wall of a 4-wheel van. The same principle was used by thousands of Australian airmen during the last war to make souvenir trinkets. A solvent for Perspex is ethylene dichloride. Save the sawdust when cutting Perspex, then, when it's necessary to cement two pieces together, dissolve some of the sawdust in a little ethylene dichloride to make 'liquid Perspex', and use this as a cementing medium. When an ordinary

butt joint is to be made in Perspex, the piece that is going to do the "butting" can be stood on it's "butting" edge for a minute or two (or until the Perspex softens) in a flat tray containing a shallow film of ethylene dichloride. Now whip it out of the liquid and press into contact with the mating piece, and in ten minutes you will have a clean cement-free rigid joint. If you can't be bothered acquiring some ethylene dichloride, Pliobond sticks Perspex very well, although it takes somewhat longer to set, and does not make a "clear" joint. The above "Perspex solution" is similar to the celluloid solution described in part 3 of this series, but whereas the celluloid had various uses in model making, as far as I know liquid Perspex is limited to the cementing work just described.

I often wonder which serviceman first found out that the so-called mosquito repellent handed out in large quantities to wartime Australian troops contained a generous lacing of ethylene dichloride, which was very handy for the boys making souvenirs. (Well Rick, I found out it started to dissolve my fountain pen when I began to write a letter one evening after the compulsory application of the stuff to all exposed parts of the skin, which meant my fingers were well smeared with repellent. From a plastic pen it would be but a step for the souvenir boys to the plastic of their erstwhile hobby. - Ed.

To get back to our subject, when considering what type of glue to use for a given job, remember that some glues have strength in themselves, whilst others are weak and useless unless doing work between two surfaces. An extreme example of the latter is ordinary home-made flour paste. Spread some of this on glass and when it dries try and peel off the resulting skin. It won't! It just falls to pieces in a powder, yet this same paste will stick

paper so tightly together that the two surfaces will be just about everlastingly bonded. At the other end of the scale we find glues, usually synthetic, that have an inherent strength of their own. Cellulose cements of various kinds fall into this group, which is the reason why a fillet of this stuff in the inside corners of a model can add a deal of structural strength, for, as the "sausage" of cement dries it shrinks, and tends to pull the parts even more tightly together. Ordinary joiner's glue, which is a "weak-by-itself" adhesive, appears to act like cellulose in this respect, but when applied thickly in the manner just described it tends to build up stresses within its own structure and usually cracks after a time, and the older the joint, the more brittle joiner's glue becomes.

Pliobond is different again to either of these glues, for it always remains "rubbery" to some extent, and has the capacity of "stretching" when stress is applied without "letting go". The animal and fish glues, which of course includes the previously mentioned joiner's glue, are milder examples of the flour paste group, not having much strength in themselves, but being enormously strong when at work in a joint, particularly if the joint has had pressure applied to drive out all excess glue and hold the joint while the adhesive sets. Yet, if cellulose cement is cramped in a joint and too much is squeezed out, the joint will be weakened quite appreciably.

The final decision on whether a given glue will work well is decided by the type of surface it is intended to cement. Cellulose cement is useless on glass, for as soon as it dries into its characteristic hard film it can be peeled away with a finger nail, yet rubbery, tough glues, like P.C. 49 and Pliobond, will cling like limpets to a glass surface. None of the synthetic cements, which includes the

three just mentioned, are particularly good for broad paper sticking as they dry too quickly for convenience, and their respective volatile base solvents do not make paper limp when applied to it, but have rather the opposite effect. Ordinary flour paste, or the commercial "office" starch pastes will certainly make paper limp when applied, but they do not stick well to wood, and are mainly intended as a paper to paper adhesive. The same thing applies to the various spirit gums and mucilages, although in this group we can occasionally find one that sticks well to hard dense wood.

Generally speaking, the "thicker" mixture usually found in the animal prepared glues, like "Glutex", is ideal for sticking paper to wood. Being an animal glue it dries slowly, giving ample time to fiddle with the positioning of, say, Brickpaper. It's high water content penetrates the paper fibres, making the paper soft and limp, and easy to "work" round corners and angles, and the fact that this type of glue has much more body than the clear "office gum" type of adhesive allows us to use it on quite porous surfaces and still get a good result. But, as I said at the start of this article, glueing is a stinker of a subject, and even if we were all industrial chemists we could argue the pros and cons of one "stickum" against another and still not agree on a single glue for a single job, so this is one aspect of our hobby that you must experiment with and find out for yourself. As likely as not you'll confound everyone by deciding that equal parts of honey and treacle is the glue you like best, but, if it sticks for you, well, that's all you need worry about. After all, I haven't actually tried the "honey-and-treacle" idea, so let me know how you get on.

And, as an example of how the Knowledge which is Experience sometimes knows more than the Know-

ledge - a younger Knowledge - which is Science, I submit the following little snippet without comment, except to say that it is true.

Recently, two young Government scientists engaged in research on timber problems argued with an old cabinet maker in the laboratory workshop.

A wager was made that scientific glueing could put "rule-of-thumb" glueing to shame. Great activity in the lab. as beam balance, thermometers, flasks and meticulous amounts of filtered water were organized.

The old C.M. watched this with interest then tossed a handful of pearls (Pearl glue) and a cup of tap water into his already bubbling glue kettle.

The two joints were made, and the test day arrived.

The scientific joint was fitted to the machine, the lead shot poured into the container and the joint sheered at 510 lbs.

Jubilation in the Scientific Camp!

The old Cabinet-maker proffered his sample, the shot poured again until the joint broke - at 555 lbs!

The old C.M. grinned, and filled his pipe . . .

AT the conclusion of yet another JOURNAL I express my thanks to our worthy Contributors for their continuing good work, and again invite those who could, but have as yet, not contributed an article, to do so - for this is Your Paper - the medium open for you in which to express yourself.